

Bead Ruptor 12

User Manual



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WARRANTY INFORMATION

This manual is a guide for the use of the Bead Ruptor 12 Bead Mill Homogenizing System and accessories.

Data herein has been verified and validated. It is believed adequate for the intended use of the instrument. If the instrument or procedures are used for purposes over and above the capabilities specified herein, confirmation of the validity and suitability should be obtained, otherwise Omni International does not guarantee results and assumes no obligation or liability. This publication is not a license to operate under, or a recommendation to infringe upon, any process patents.

Notes, cautions, and warnings within the text of this manual are used to emphasize important and critical instructions.

This Omni International product is warranted to be free from defects in material and workmanship for a period of ONE YEAR from the date of delivery. Omni International will repair or replace and return free of charge any part which is returned to its factory within said period, transportation prepaid by user, and which is found upon inspection to have been defective in materials or workmanship. For the first 90 days, both parts and service are without charge. For the balance of the period, parts will be provided but service will be charged at established labor rates. This warranty does not include normal wear from use; it does not apply to any instrument or parts which have been altered by anyone other than an employee of Omni International nor to any instrument which has been damaged through accident, negligence, failure to follow operating instructions, the use of electric currents or circuits other than those specified on the plate affixed to the instrument, misuse, or abuse. Omni International reserves the right to change, alter, modify, or improve any of its instruments without any obligation whatever to make corresponding changes to any instrument previously sold or shipped.

THE FORGOING OBLIGATION IS IN LIEU OF ALL OBLIGATIONS AND LIABILITIES INCLUDING NEGLIGENCE AND ALL WARRANTIES OF MERCHANTABILITY OR OTHERWISE, EXPRESSED OR IMPLIED IN FACT OR BY LAW, AND STATE OUR ENTIRE AND EXCLUSIVE LIABILITY AND BUYERS EXCLUSIVE REMEDY FOR ANY CLAIM OF DAMAGES IN CONNECTION WITH THE SALE OR FURNISHING OF GOODS OR PARTS, THEIR DESIGN, SUITABILITY FOR USE, INSTALLATION, OR OPERATION. OMNI INTERNATIONAL WILL IN NO EVENT BE LIABLE FOR ANY SPECIAL OR CONSEQUENTIAL DAMAGES WHATSOEVER, AND THEIR LIABILITY UNDER NO CIRCUMSTANCES WILL EXCEED THE CONTRACT PRICE FOR THE GOODS FOR WHICH LIABILITY IS CLAIMED.

SECTION 1. IMPORTANT SAFEGUARDS

READ ALL INSTRUCTIONS BEFORE USING

SAVE THIS USER MANUAL

The Bead Ruptor 12 has been engineered for maximum functionality as well as safety; however, basic safety precautions and common sense must always be demonstrated when using any electrical product. Do not attempt to modify any part of the Bead Ruptor 12. If you experience problems with or have questions about your Bead Ruptor 12, contact your authorized dealer or call Omni at 1-800-776-4431 or 770-421-0058.

WARNING!

- DO NOT allow the machine to be submerged in any liquid.
- DO NOT use in any setting other than an indoor laboratory.
- DO NOT plug power cord into an incorrect outlet.
- Keep this product away from heated surfaces.

To reduce the risk of burns, electrocution, fire, or injury:

- Use this product only for its intended purpose as described in this booklet. Do not use attachments not recommended by the manufacturer.
- DO NOT operate the product if it is damaged in any way.

RISK OF ELECTRIC SHOCK:

Although this equipment is fully insulated and grounded, it is important for all users to be aware of the potential hazard of using liquids close to a power supply. If any liquids are spilled, immediately disconnect the instrument from the main power supply (remove the power cord from the AC power input on the rear panel) and clean the equipment and the surrounding area. DO NOT reconnect the equipment until it has been fully inspected.

SECTION 2. UNPACKING THE BEAD RUPTOR 12

2.1 UNPACKING THE BEAD RUPTOR 12

CAUTION: DO NOT lift the Bead Ruptor 12 by holding the lid. It must be lifted by gripping the sides of the unit and holding it from the bottom.

1. Place the crate on a level floor surface.
2. Using a screwdriver or power drill, remove the 16 screws from the bottom edge of the crate.
3. Lift the lid from the crate.
4. Lift and remove the inner cardboard box
5. Unscrew the two external knob screws from the back of the unit to release from the support plate.
6. Slide the Bead Ruptor away from the knob screw holes.
7. Lift the unit up and off of the crate bottom. **DO NOT LIFT THE UNIT BY HOLDING THE LID.**
8. Place the Bead Ruptor on a clean, horizontal and stable surface and remove the plastic bag



PLEASE NOTE: Do not discard the crate & packaging foam. This packaging must be used in the event the Omni Bead Ruptor 12 needs to be returned to Omni for any reason.

SHIPPING THE BEAD RUPTOR IN ANY OTHER PACKAGING WILL VOID ALL WARRANTIES.

SECTION 2. UNPACKING THE BEAD RUPTOR 12

Remove the warning sticker from the back of the unit and check that the voltage switch matches the voltage delivered by your electric power supply.



CAUTION!

If the voltage supplied to the equipment is higher than what is indicated on the voltage switch, the electronics can be irreversibly damaged, voiding the warranty.

Ensure that the air vents are not covered. Allow at least 6 inches of space around air vents for proper motor ventilation.

CAUTION: DO NOT connect the unit to the main power supply until installation is complete and the correct voltage is selected.

Plug the Bead Ruptor 12 into the power supply using the supplied power cord.

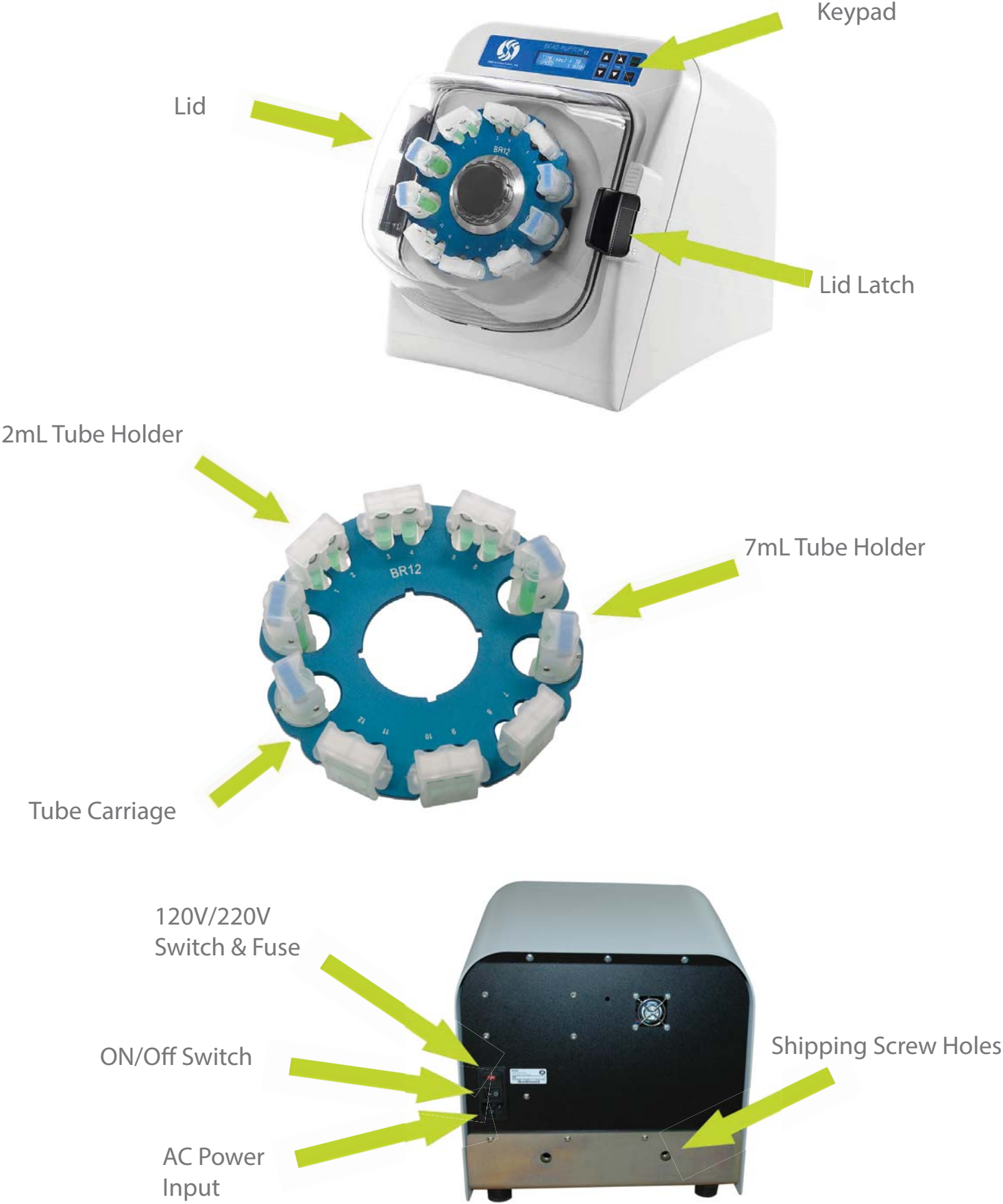
In the event of a malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This instrument is equipped with an electric cord which is grounded to the chassis housing. The plug must be plugged in to an outlet that is properly installed and grounded in accordance with all local codes and ordinances.

WARNING: DO NOT modify the plug or cord that is provided. Damaged or worn power cords should be repaired or replaced immediately by a qualified electrician.

- **DO NOT** turn the unit upside down: the Bead Ruptor 12 must always rest on all four feet to avoid damaging internal components or breaking the housing.
- **DO NOT** operate the unit when the housing is removed; potentially lethal voltage exists within the instrument.
- **DO NOT** operate the unit with the safety ground disconnected.

CAUTION: Use only accessories and consumables recommended by the manufacturer. Accuracy and operating lifetime may be affected if alternative products are used. Any damages caused by non-recommended parts are not covered by the manufacturer's warranties.

2.2 UNIT OVERVIEW



SECTION 2. UNPACKING THE BEAD RUPTOR 12

2.3 COMPONENTS

Prior to operation, please remove all parts from the shipping container and inspect for damaged or missing parts. If any parts are found to be damaged or missing, please contact Omni International at 1.800.776.4431

Description	Quantity	P/N
Motor Drive Unit (115V or 220V)	1	19-050
Tube Carriage (12x2mL & 4x7mL)	1	19-344-5072
Semi-Permanent Ring	1	19-333-01
Power Cable	1	LT710 (115V) or LT712 (220V)
Spare Fuse	1	00-193
Instruction Manual	1	03-251
Quick Start Guide	1	03-253

SECTION 3. BEAD RUPTOR SAMPLE TUBES

3.1 TUBES & TUBE CARRIAGE

One Tube Carriage is available for the Bead Ruptor 12.

Tube Carriage for 12x2mL & 4x7mL screw cap tubes

2mL Tube Volume and Tissue Size:

Minimum: 300µL 30mg

Maximum: 1.8mL, 1g

7mL Tube Volume and Tissue Size:

Minimum: 1mL, 1g

Maximum: 5mL, 4g



A maximum volume of 41.6mL can be processed with this tube carriage configuration, per run.
 $(4 \times 5\text{mL}) + (12 \times 1.8) = 41.6\text{mL}$

Use the chart on page 10 to select the best tubes for your sample type,
or to view a selection of Bead Ruptor specific applications visit.

www.omni-inc.com/applications

SECTION 3. BEAD RUPTOR SAMPLE TUBES

3.2 TUBE SELECTION GUIDE

	LYSE / DISRUPT			RNA	HOMOGENIZE			GRIND
Part #	19-621	19-622	19-623	19-625	19-627	19-628	19-624	19-620

MICROBIAL

Bacteria	✓	✓	✓	✓				
Yeast		✓	✓	✓	✓			
Fungi	✓	✓	✓	✓				
Spores	✓	✓	✓	✓				

ANIMAL

Skin					✓	✓	✓	✓
Nerves					✓	✓		
Artery						✓	✓	
Intestine						✓	✓	
Tumors						✓	✓	✓
Brain					✓	✓	✓	
Liver					✓	✓	✓	
Kidney					✓	✓	✓	
Lung					✓	✓	✓	
Heart					✓	✓	✓	

FISH / INSECTS

Insects					✓	✓		✓
Zebrafish		✓			✓		✓	

PLANT

Leaves						✓		✓
Seeds						✓		✓
Rice						✓		✓
Wheat						✓		✓
Stems						✓		✓
Roots						✓		✓
Moss					✓	✓		✓

SOIL

Soil				✓	✓	✓	✓	✓
Sediment				✓	✓		✓	✓

SECTION 3. BEAD RUPTOR SAMPLE TUBES

3.3 ORDERING INFORMATION

2mL & 0.5mL PRE-FILLED BEAD MILL SAMPLE TUBES

BEAD MEDIA	TUBE SIZE	BEAD SIZE	DESCRIPTION	QUANTITY	DNase/RNase FREE PART#	UNTREATED* PART#
Glass	2mL	0.1mm	Micro-Organism Lysing Mix	50	19-621	N/A
	2mL	0.5mm	Tough Micro-Organism Lysing Mix	50	19-622	19-622C
Garnet	0.5mL	0.15mm	Small Volume Micro-Organism Lysing Mix	50	19-623	N/A
	2mL	0.7mm	Hard & Fibrous Tissue Homogenizing Mix	50	19-624	19-624C
Carbide	0.5mL	0.25mm	RNA Extractions, Micro-Organism & Soil Homogenizing Mix	50	19-625	N/A
Ceramic	2mL	1.4mm	Soft Tissue Homogenizing Mix	50	19-627	19-627C
	2mL	2.8mm	Hard Tissue Homogenizing Mix	50	19-628	19-628C
Metal	2mL	2.38mm	Hard Tissue Grinding Mix	50	19-620	19-620C

*Untreated Tubes are clean but not certified DNase or RNase free.

Bulk Sample Tubes (No Beads)

Empty sample tubes with caps and O-Rings. Beads are not included.

TUBE SIZE	DESCRIPTION	QUANTITY	ORDER NUMBER
2mL	Empty Sample Tubes with Caps	500	19-648
2mL	Empty Sample Tubes with Caps	1000	19-649
0.5mL	Empty Sample Tubes with Caps	500	19-650

Bead Ruptor Tube Sample Pack

Includes 4 each of the following pre-filled sample tubes: 1.4mm ceramic beads, 2.8mm ceramic beads, 0.5mm glass beads, 0.1mm glass beads, 2.38mm metal beads.

DESCRIPTION	ORDER NUMBER
Bead Ruptor Tube Sample Pack	19-SAMPLE

It is Strongly recommended that only Omni Tubes be used with the Bead Ruptor 12. Other tubes might not be capable of withstanding the forces generated by the Bead Ruptor 12.

SECTION 3. BEAD RUPTOR SAMPLE TUBES

7mL Bead Mill Tubes - These Tubes are not pre-filled with beads.

BEAD MEDIA	TUBE SIZE	BEAD SIZE	DESCRIPTION	QUANTITY	ORDER NUMBER
Glass	7mL	0.1mm	Empty Sample Tubes with Micro-Organism Lysing Bead Mix	50	19-654
	7mL	0.5mm	Empty Sample Tubes with Tough Micro-Organism Lysing Bead Mix	50	19-656
Ceramic	7mL	1.4mm	Empty Sample Tubes with Soft Tissue Homogenizing Bead Mix	50	19-652
	7mL	2.8mm	Empty Sample Tubes with Hard Tissue Homogenizing Bead Mix	50	19-653
Metal	7mL	2.38mm	Empty Sample Tubes with Hard Tissue Grinding Bead Mix	50	19-655
None	7mL	-	Empty Sample Tubes	1,000	19-651

7mL Bead Tubes are not certified RNase/DNase Free and are not currently available pre-filled.

7mL Tube Specifications:

- Polypropylene (PP)
- Screw cap tube ONLY
- Maximum centrifugation speed of 5,000g

Treatable Volume:

- Minimum: 1mL, 1g
- Maximum: 5mL, 4g
- Used with or without buffer

It is strongly recommended that Omni 7mL Tubes be used in conjunction with the Bead Ruptor 12. Our tests have shown that Omni Tubes are the only tubes available that are capable of withstanding the forces generated by the Bead Ruptor.

SECTION 3. BEAD RUPTOR SAMPLE TUBES

3.4 IMPORTANT SAMPLE TUBE INFORMATION

Dry, fresh or frozen samples can be homogenized with or without buffer using the Bead Ruptor 12 and Bead Ruptor sample tubes.

Omni offers unique reinforced 2mL tubes with an O'ring seal in the cap. These tubes can withstand the motion, velocity, and force applied to the tube carriage.

In the event of tube leakage or tube breakage, Omni recommends the following solutions:

- Use the Tubes as single-use or disposable
- Do not submerge the tubes in liquid nitrogen
- Add more buffer to decrease the force applied by the beads to the tube walls
- Ensure tube caps are tightened completely
- If using bulk beads and tubes, add the recommended amount of beads to the tube

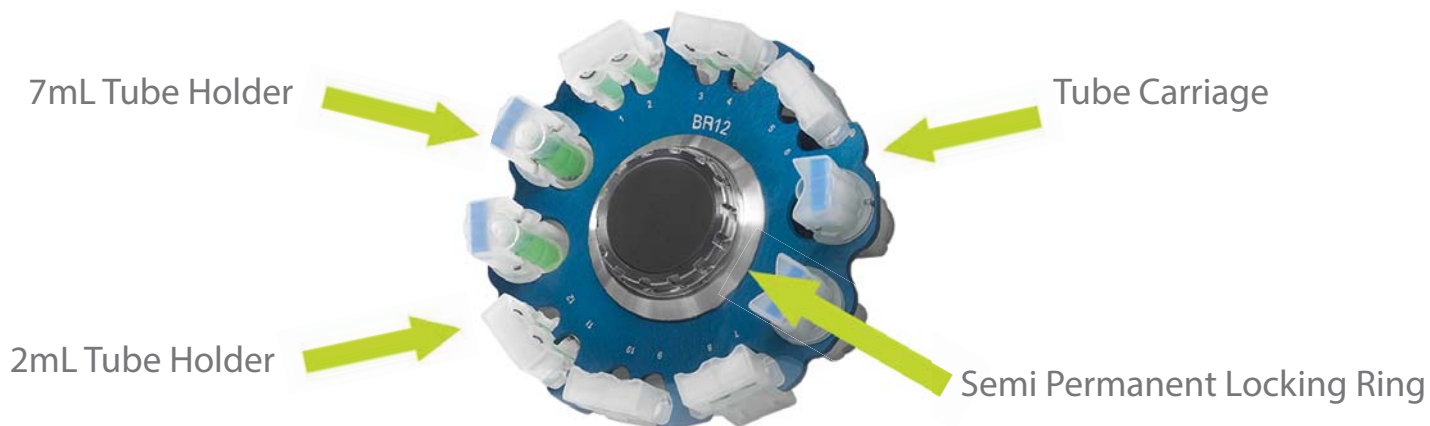
SECTION 4. BEAD RUPTOR OPERATION

4.1 LOADING SAMPLE TUBES

Users can simultaneously homogenize 1 to 16 samples per run. The user may load tubes in any position for processing.

DO NOT RUN AN EMPTY TUBE CARRIAGE.

IDENTIFICATION OF PARTS:



CAUTION: The drive hub can become very hot during operation. Use caution when removing tubes from the Tube Carriage / Tube Holders.



Note: 7mL tubes are inserted upside down, unlike the 2mL tubes, which go in right side up.



1. Place Bead Ruptor Tubes into the Tube Holders.
 2. Close the lid until the locking lid handle clicks.
- 14.

SECTION 4. BEAD RUPTOR OPERATION

4.2 KEYPAD LAYOUT

The keypad of the Bead Ruptor 12 (see diagram below) consists of an LCD screen, 4 arrow buttons, and a "START" and "STOP" button.

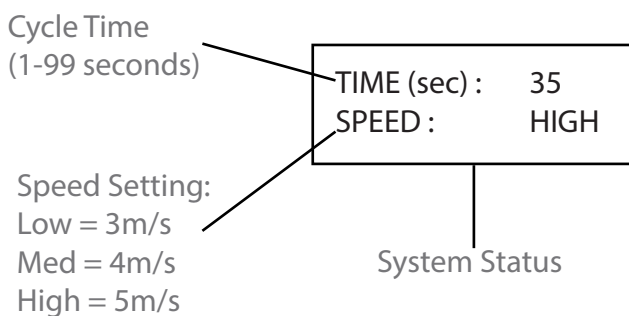


The user can adjust two different homogenization settings with this interface. The UP arrow and DOWN arrow buttons are used to adjust the speed and time parameters.

4.3 START UP OF THE EQUIPMENT

Turn the Bead Ruptor 12 on by pressing the ON/OFF switch located on the rear panel near the AC power input.

A Menu displays the programming mode. Programming mode displays the last program run before power was removed. Example:



- Speed denotes energy imparted to the samples in m/s and can be set at 3m/s (low), 4m/s (med), or 5m/s (high).

- Time denotes the processing time in seconds. Time can be set from 0:01 seconds to 0:99 seconds in 1 second increments.

SECTION 4. BEAD RUPTOR OPERATION

4.4 SPEED SETTING

Homogenization with the Bead Ruptor 12 is the result of the collision of the bead matrix and sample within the Bead Ruptor tubes. The frequency of collision and energy of impact determine the effectiveness of the disruption process and are controlled by the Bead Ruptor 12 speed setting, the motion of the tube carriage, the bead media, and the tube fill volume.

The “Speed” of the Bead Ruptor is presented in m/s, which is a specific representation of the forces applied to the sample, due to the velocity of the tube carriage movement, and the speed and geometry of the motion. Using RPM, for example, is not representative of the bead movement and processing energy because RPM only indicates the motor speed.

SECTION 5. PROGRAMMING

5.1 PROGRAMMING

The Bead Ruptor 12 is programmable for Speed/Processing Energy and Time. The Bead Ruptor memory will store the last program settings used.

After powering on, the LCD screen will display the last used speed and time settings. The UP and DOWN arrow keys respectively increase or decrease the value of the active variable (speed or time) by holding down the arrow button.



Active Variable

Speed
Time

System Status Display

SPEED m/s
CYCLE TIME (sec)

Parameter	Operating Range
Speed / Energy	Low / Medium / High
Time	From 1 second to 99 seconds
Storable Programs	1

- If run is stopped or paused system status will read “RUN CANCELLED”
- At the end of the program “RUN COMPLETE” will be displayed

CAUTION: Wait until the unit stops completely and displays “RUN COMPLETE” before opening the lid.

PLEASE NOTE:

- Homogenization settings cannot be changed once the run is in progress
- The Bead Ruptor 12 is designed for non-stop use and does not require a cool down period between runs.

The user can pause or stop a run by pressing the “STOP” button at any time.

SECTION 6. RECOMMENDED SETTINGS

Please Note: These protocols are provided as a basic guideline only. the listed settings might need to be modified for your particular sample type, viscosity, weight, volume, cell concentration and other factors that effect homogenization. If you have any questions regardsing your application, please call Omni Technical support at 1.800.776.4431

		BEAD MATRIX	SETTING	APPLICATION
Sample Name and Type		Lysing Matrix	Speed - number of cycle x time - pause	Note
MICROBIAL	Bacteria	19-623	Low - 1 x 5 min	DNA Isolation
ANIMAL	Muscle	19-628	High - 2 x 45 min	RNA Isolation
	Brain	19-628	High - 2 x 45 min	RNA Isolation
	Liver	19-628	High - 2 x 45 min	RNA Isolation
	Kidney	19-628	High - 2 x 45 min	RNA Isolation
	Lung	19-628	High - 2 x 45 min	RNA Isolation
	Heart	19-628	High - 2 x 45 min	RNA Isolation
	Spleen	19-628	High - 2 x 45 min	RNA Isolation
PLANT	Leaves	19-628	High - 2 x 45 min	RNA Isolation
	Leaves	19-620	Low - 1 x 3 min	DNA Isolation
	Seeds	19-620	Medium - 1 x 3 min	DNA Isolation
	Stems	19-628	Low - 1 x 5 min	RNA Isolation
	Stems	19-620	Medium - 1 x 3 min	DNA Isolation
	Roots	19-628	High - 2 x 45 min	RNA Isolation
	Roots	19-620	Medium - 1 x 3 min	DNA Isolation
	Flowers	19-628	High - 2 x 45 min	RNA Isolation
SOIL	Soil	19-624	Low - 1 x 5 min	DNA Isolation

[Our Applications database can help you find the best solution - quickly.](#)

Our constantly expanding database consists of carefully reviewed customer published applications to help you find the right laboratory homogenizer for any sample type.

www.omni-inc.com/applications

SECTION 7. MAINTENANCE

7.1 CLEANING THE BEAD RUPTOR 12

The housing of the unit can be cleaned with a sponge or damp cloth moistened with water or alcohol.

WARNING: For safety purposes and to prevent any damage of the unit, the recommendations listed below should be strictly followed:

- **ALWAYS** disconnect the power cord before cleaning
- **DO NOT** spray water directly on the unit, especially in the air vents and the fan
- **DO NOT** use any type of scrapers
- **DO NOT** use caustic solvents or acetone. Harsh solvents can damage the finish of the housing and lid

Example of Decontamination Procedure

If a tube breaks when a run is in progress, decontaminate parts that may have been contaminated with an appropriate disinfectant. The decontamination procedure is the sole responsibility of the user. Parts that may have been contaminated can be cleaned with a sponge or a damp cloth moistened with a non-abrasive cleaner.

In case another decontamination procedure is to be applied, please first contact technical support to ensure the compatibility of the new procedure with the instrument.

SECTION 8. TROUBLESHOOTING

DO NOT attempt to service the Bead Ruptor 12 in a manner other than those discussed in this manual. For any issue that is unsuccessfully corrected using this guide, please contact your authorized dealer or call Omni International at: 800.776.4431

8.1 ERROR MESSAGES

Error Message	Possible Causes	Action(s)
Close Door	The lid is not latched properly	1. Check that nothing prevents the lid from closing. 2. Press lid and ensure the handle is locked properly.
	Detection system is faulty	1. Turn off the unit. 2. Contact technical assistance.

8.2 TROUBLESHOOTING

Problem	Possible Causes	Action(s)
The fan does not work	No Power	1. Check main voltage 2. Check that the voltage of the unit matches that being delivered by the main power supply. 3. Make sure that the unit is plugged in properly. 4. Check and replace fuses if blown.
	Faulty Fan	1. Turn off the unit. 2. Contact technical support.
Display screen shows incomplete or unusual characters	CPU needs to be reset	1. Turn off the unit. Wait a few seconds. Turn the unit back on.
No display on the screen	No Power	1. Check main voltage. 2. Check that the voltage of the unit matches that being delivered by the main power supply. 3. Make sure the unit is plugged in properly. 4. Check and replace fuses if blown.
	Faulty display screen	1. Turn off the unit. 2. Contact technical support.
One or several tubes are not sealed tightly	The cap is not properly sealed or the tube is faulty	If dangerous or potentially dangerous sample is contained in the tube, apply the proper decontamination procedure.
Unit powers on with a loud "BANG"	Motor control device damaged due to incorrect voltage selection	Return unit to Omni International for replacement of motor control device.
Unit powers on but motor does not turn	Incorrect voltage selected	Power off the unit and select appropriate voltage. Power on the unit. If problem persists, contact Omni International for assistance.
Tube leakage	Speed is too high or High temperature or pressure inside tubes	See solutions on page 13

SECTION 8. TROUBLESHOOTING

8.3 REMOVING THE LOCKING RING

1. Remove two adjacent 7mL tube holders.
2. Unscrew the three set screws around the locking ring using a .050 Allen Wrench.
3. Use the 58 to 62 Spanner Wrench provided to loosen the locking ring from the BR12 hub.
4. Finish unscrewing the locking ring by hand and remove from the hub.



SECTION 9. TRANSPORT, STORAGE & SERVICE

9.1 TRANSPORTING THE BEAD RUPTOR 12

The Bead Ruptor 12 must be shipped in its original packaging.

Before transporting the equipment, it is necessary to:

1. Close the lid of the Bead Ruptor 12 and cover with the plastic bag.
2. Align the slots on the bottom of the unit with the support hooks on the base of the shipping crate.
3. Lower the unit onto the hooks and slide it backward until the back of the unit touches the supporting edge.
4. Secure the unit to the support plate with the included knob screws. Tighten the screws as much as possible.
5. Place the cardboard box over the Bead Ruptor.
6. Use a screwdriver or power drill to secure the lid to the top of the crate with 16 screws.



SECTION 9. TRANSPORT, STORAGE & SERVICE

PLEASE NOTE: The Bead Ruptor 12 MUST be shipped in its original packaging. Failure to do so can result in serious damage to the unit and will void all warranties.

9.2 STORAGE

The unit can be used in a cold room, but it must be stored in a dry area at a temperature ranging from 0°C/32°F to 50°C/122°F

9.3 SERVICE

It is recommended that the speed of the Bead Ruptor 12 be calibrated annually to ensure maximum operation. For this or any other product servicing please contact Omni International at 800.776.4431.

9.4 DECONTAMINATION REQUIREMENT

Should an instrument or component that has been used with radioactive or pathogenic material require factory or field service, comply with the following procedure to ensure the safety of service personnel:

Clean the parts to be serviced of all encrusted material and decontaminate them. There must be no radioactivity detectable by survey equipment. Obtain a decontamination Certificate from Omni International. Complete the certificate and attach to the instrument or parts being returned.

If no Decontamination Certificate is attached, and a potential radioactive or biological hazard is detected or suspected by Omni International, the equipment will not be serviced until proper decontamination and certification is complete. The sender will be contacted for instructions as to the disposition of the equipment. Disposition costs will be borne by the sender.

WARNING: It is a violation of federal law to transport biologically hazardous or radioactive materials without proper packaging, labeling, and appropriate warnings.

SECTION 10. SPECIFICATIONS

10.1 SPECIFICATIONS

Length:	17in / 43.2cm
Width:	12in / 30.5cm
Height:	14.5in / 36.9cm
Weight:	44lbs. / 17kg
Energy Performance Range:	3m/s - 4m/s - 5m/s Low - Med - High
Noise Level:	<70db
Electrical Requirements:	115 volts, 60Hz or 220 volts, 50Hz
Standards Approval / Compliance	CE certified

Register your Bead Ruptor & tell us about your research!

Please visit the web address below to register your new Bead Ruptor. You will also be asked to provide us with information about your research. In return, we'll send you a Starbucks gift card!

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